CS468152

Release Your Hands: Automate Your BIM360 Project Setup with Forge

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Senior developer advocate in Autodesk, more than 10 years software development experiences in CAD area, 5 years experiences in Forge technology advocating, consulting and supporting, currently mainly focus on AEC industry including BIM360, Revit Design Automation and all the generic Forge services.

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Developer Technical Services
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Mikako provides API technical support for AEC products, such as Revit and BIM 360. Her interest is in the areas of interactive techniques, optimization and layout synthesis. More on her blog: https://fieldofviewblog.wordpress.com/
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October 6, 2020
Agenda

- Introduction
- Project Setup Tool
  - Overview
  - How to Use - Step by Step
- Extending Features & Customization
- Future Work
Project Setup in BIM 360
Project Setup in BIM 360

Product UI
- Easy to use
- Not scalable 😞

Customers want:
- Bulk import
- Template
- Migrate
- Integrate with ERP
Project Setup Tool

- Using public API
- Originally written by Autodesk Consulting team
- Command line tool
  - .NET
  - Desktop application
  - csv file as input
  - Open source on GitHub
Project Setup Tool

Who is it for?

• Developers, IT and power users w/ .NET knowledge
  ▪ Build the exe
  ▪ Customize
  ▪ Develop an integration

• Not directly intended for non-programmers to do above

• Once you have the exe, anybody can use
Project Setup Tool
Overview
https://github.com/Autodesk-Forge/forge-bim360.project.setup.tool
Basic Features

Project
- Create Projects From Scratch
- Create Projects From Template

Service
- Activate Project Services

User
- Import Project Users
- Update Project Users
Workflow

**PREPARATION**
- Account & CSV file
  - BIM 360 account
  - Forge App
  - Integrate Forge App with BIM 360 Account
  - CSV file

**PROJECTS**
- Create projects
  - Create BIM 360 projects from scratch
  - Create BIM 360 projects from template

**SERVICES**
- Assign services
  - Services are assigned to the project with admin

**IMPORT USER**
- Import project users
  - Import project users
  - Only document management and project administration supported
  - Admin or normal user

**UPDATE USER**
- Update project users
  - Update project users
  - Support access, company, role
How to use – Step by Step
Step 0: Preparation – Account
### Step 0: Preparation – CSV file

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<thead>
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<th>service_type</th>
<th>email</th>
<th>company</th>
</tr>
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<tr>
<td>AU Sample Project 01</td>
<td>admin</td>
<td><a href="mailto:wuthong@domiler.com">wuthong@domiler.com</a></td>
<td>Test account by (Zhong Wu)</td>
</tr>
<tr>
<td>AU Sample Project 02</td>
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</tr>
</tbody>
</table>
Command Line Options


- File path (at least one path to an input file is required)
  - -p Path to CSV input file for project creation
  - --CF Copy folders
  - -x Path to CSV input file for service activation
  - -u Path to CSV input file with project user information
  - --UP Update project users

- Account Info (Required)
  - -c Forge client ID
  - -s Forge client secret
  - -a BIM 360 Account ID

- CSV file related
  - -t Separator character (default = ';')
  - -z Second Separator character (default = ',')
  - -e Encoding (default = UTF-8)
  - -d Date time format pattern (default = yyyy-MM-dd)

- Others
  - -r Trial run [true/false] (default = false)
  - -b BaseUrl (default = "https://developer.api.autodesk.com")
  - --AR Admin Industry Role
  - --EU Use the EU region account
  - --h BIM 360 Account admin Email address, required for importing users and
Step 1: Create Projects (from scratch)

Command:

```
Autodesk.BimProjectSetup.exe -p "\sample\BIM360_Projects_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -a "<ACCOUNT-ID>"
```

API Used:
- POST: /accounts/:account_id/projects
Step 1: Create Projects (from template)

Command:
```
Autodesk.BimProjectSetup.exe -p \".\sample\BIM360_Projects_CF_Template.csv\" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -a "<ACCOUNT-ID>" --CF -h "admin@company.com"
```

**API Used:**
- POST: /accounts/:account_id/projects (create project)
- POST: /data/v1/projects/:project_id/folders (create folder)
- GET: /bim360/docs/v1/projects/:project_id/folders/:folder_id/permissions (get permission)
- POST: /bim360/docs/v1/projects/:project_id/folders/:folder_id/permissions:batch-create (create permission)
Step 2: Activate services

Command:

Autodesk.BimProjectSetup.exe -x ".\sample\BIM360_Service_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -a "<ACCOUNT-ID>

API Used:

• POST: /accounts/:account_id/projects/:project_id/users
Step 3: Import project users

Command:
Autodesk.BimProjectSetup.exe -u "\sample\BIM360_ProjectUser_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -a "<ACCOUNT-ID>" -h "admin@company.com"

API Used:
• POST: /accounts/:account_id/projects/:project_id/users/import
## Project Directory

The Project Directory lists all projects in your account.

<table>
<thead>
<tr>
<th>Name</th>
<th>Members</th>
<th>Companies</th>
<th>Project Status</th>
<th>Last Sign In</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Sample Project 01</td>
<td>1</td>
<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>11 Sample Project 01 - Copy Folder</td>
<td>1</td>
<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>11 Sample Project 02</td>
<td>1</td>
<td>1</td>
<td>Active</td>
<td></td>
</tr>
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<td>11 Sample Project 02 - Copy Folder</td>
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<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
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<td>Active</td>
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<td></td>
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<tr>
<td>11 Sample Project 05</td>
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<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>11 Sample Project 06</td>
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<td>Active</td>
<td></td>
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<td>11 Sample Project 07</td>
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<td>11 Sample Project 08</td>
<td>1</td>
<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>11 Sample Project 09</td>
<td>1</td>
<td>1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>project_name</td>
<td>email</td>
<td>pm_access</td>
<td>docs_access</td>
<td>company_name</td>
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<tr>
<td>----------------------</td>
<td>----------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>AU Sample Project 01</td>
<td><a href="mailto:user@company.com">user@company.com</a></td>
<td>admin</td>
<td>admin</td>
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<td>AU Sample Project 03</td>
<td><a href="mailto:admin@company.com">admin@company.com</a></td>
<td>admin</td>
<td>admin</td>
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<tr>
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<td>Test account by (Zhong Wu)</td>
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<tr>
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<td>admin</td>
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<tr>
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<td>admin</td>
<td>admin</td>
<td>Test account by (Zhong Wu)</td>
</tr>
</tbody>
</table>

Command:

```
Autodesk.BimProjectSetup.exe -u "\sample\BIM360_ProjectUser_UP_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -a "<ACCOUNT-ID>" -h "admin@company.com" --UP
```

API Used:

- PATCH: /hq/v2/accounts/:account_id/projects/:project_id/users/:user_id
# Project Admin

Project Members

Project Members lists all members of your project. This list includes pending members who have been invited to services but not yet activated their accounts as well as inactive members who were disabled by an account admin.

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Email</th>
<th>Company</th>
<th>Role</th>
<th>Project Admin</th>
<th>Glue</th>
<th>Fluid</th>
<th>Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>NM</td>
<td>Pending</td>
<td><a href="mailto:admin@company.com">admin@company.com</a></td>
<td>Test account by (Zhon..</td>
<td>Architect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NM</td>
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<tr>
<td></td>
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<td>Test account by (Zhon..</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Filters**

- **SERVICE**
  - Document Management (3)
  - Project Management (1)

**Activate Windows**

Go to Settings to activate Windows.
Limitation & Tips

Limitation:

- Copy Folder only support Plans and Project Files folder.
- Copy folder support copy role permissions with this tool.
- Import project user only support Project Administrate and Document management module, due to the API limitation.
- API only supports English(en) and German(de) language.
- Activate Docs service currently not working. It’s being fixed (ACSPA-1217).

Tips:

- set FORGE_CLIENT_ID, FORGE_CLIENT_SECRET, FORGE_BIM_ACCOUNT_ID without quotation marks.
- Add account admin email address of “-h” for creating project from template and Importing/Updating project users.
- After creating a new project, wait for a couple of seconds before trying to access the contents of this new project(dev).
Extending Features & Customization
Setup project services automatically
Advanced Features

**Budget code template**
- Setup
  - (Cost Management)

**Model Sets**
- Setup
  - (Model Coordination)

[https://github.com/JohnOnSoftware/forge-bim360.project.setup.tool](https://github.com/JohnOnSoftware/forge-bim360.project.setup.tool)
Budget code template setup

**Command:**

- Autodesk.BimProjectSetup.exe -pcs "\sample\BIM360_CostSegments_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -k "<FORGE-CALLBACK>" -a "<ACCOUNT-ID>"
- Autodesk.BimProjectSetup.exe -pcv "\sample\BIM360_CostSegmentValues_Template.csv" -c "<YOUR-CLIENT-ID>" -s "<YOUR-CLIENT-SECRET>" -k "<FORGE-CALLBACK>" -a "<ACCOUNT-ID>"

**API used:**

- POST: /cost/v1/containers/:containerId/templates/:templateId/segments
- POST: /cost/v1/containers/:containerId/segments/:segmentId/values:import
# Model sets setup

**Project Admin**

**Overview**

- Autodesk.BimProjectSetup.exe
  - pms "<YOUR_CLIENT_ID>" -c "<YOUR_CLIENT_SECRET>" -k "<FORGE_CALLBACK>" -a "<ACCOUNT_ID>"

**POST:** /bim360/modelset/v3/containers/:containerId/modelsets

<table>
<thead>
<tr>
<th></th>
<th>name</th>
<th>description</th>
<th>isDisabled</th>
<th>folder</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU Sample Project 01 - Copy Folder</td>
<td>1st Test Model Set 3</td>
<td>this is a model set</td>
<td>TRUE</td>
<td>Project Files/Doc1</td>
</tr>
<tr>
<td>AU Sample Project 01 - Copy Folder</td>
<td>2nd Test Model Set 3</td>
<td>this is a model set</td>
<td>TRUE</td>
<td>Project Files/Doc2</td>
</tr>
</tbody>
</table>

**Command:**

- Autodesk.BimProjectSetup.exe -pms "\sample\BIM360_ModelCoordinationModelSets_Template.csv" -c "<YOUR_CLIENT_ID>" -s "<YOUR_CLIENT_SECRET>" -k "<FORGE_CALLBACK>" -a "<ACCOUNT_ID>"
Tips for developers

```csharp
public class ThreeLeggedWorkflow : BaseWorkflow
{
    private ThreeLeggedApi _threeLeggedApi = new ThreeLeggedApi();
    private string _threeLeggedToken = null;
    private static HttpListener _httpListener = null;
    private static readonly Scope[] _scope = new Scope[] {Scope.DataRead, Scope.DataWrite};

    public void initToken()
    {
        // Initialize our web listener
        _httpListener = new HttpListener();
        _httpListener.Prefixes.Add(options.ForgetCallback.Replace("\"localhost\", "+") + "+");
        _httpListener.Start();
        IAsyncResult result = _httpListener.BeginGetContext(_3LeggedAsyncWaitForCode, null);

        // Generate a URL page that asks for permissions for the specified scopes, and call our default web browser.
        string oauthUrl = _threeLeggedApi.Authorize(_options.ForgetClientId, oAuthConstants.CODE, _options.ForgetCallback, _scope);
    }

    internal async void _3LeggedAsyncWaitForCode(IAsyncResult ar)
    {
        // grab the code from the URL
        var context = _httpListener.EndGetContext(ar);
        string code = context.Request.QueryString[oAuthConstants.CODE];

        // request or find access token
        ApiResponse dynamic bearer = await _threeLeggedApi.GetTokenAsyncWithHttpInput(_options.ForgetClientId, _options.ForgetClientSecret, oAuthConstants.AUTHORIZATION_CODE, code, _options.ForgetCallback);
        _threeLeggedToken = bearer.data.access_token;

        _httpListener.Stop();
    }
}
```
Tips: Postman Collection

https://github.com/JohnOnSoftware/forge-bim360.project.setup-postman.collection
More about BIM 360 API

• Learn forge tutorial
  • https://learnforge.autodesk.io

• Official documentation
  • http://developer.autodesk.com

• Github sample
  • https://github.com/Autodesk-Forge

• AU topics:
  ❑ SD468487 - BIM 360 API Updates and Beyond by Mikako Harada
  ❑ SD463691 - Forge Roadmap by Jim Quanci & Cyrille Fauvel
Future Work
What’s Next

Continue enhancing as new API becomes available.

• Admin API
  ▪ Activating services for users
  ▪ New version of API’s (/admin/ instead of /hq/)

• Document Management
  ▪ Custom attribute definition

Have ideas? Let us know!

Open Source - contribution welcome!
Summary

• Introduction
• Project Setup Tool
  ▪ Overview
  ▪ How to Use - Step by Step
• Extending Features & Customization
• Future Work
Questions?

Comment in the class page (CS468152)
Join us at Forge Answer Bar
Thank you!

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